RUBBER-BASED CROPPING SYSTEM STUDIES IN NORTH EAST INDIA

Bhaskar Datta, M.D. Jessy[1] and Sushil Kumar Dey

Regional Research Station, Rubber Research Institute of India, Kunjaban-799 006, Agartala, India
[1]Rubber Research Institute of India, Kottayam-686 009, Kerala, India

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A cropping system experiment was conducted with variety of annual and short duration intercrops (upland rice, okra, cowpea, maize, amaranthus, colocasia, elephant foot yam, pineapple and banana) under rubber for entire immaturity period. Two different planting geometries were employed in such a way that the number of rubber per ha remained almost similar (440 and 445 ha^{-1}) In the first model, rubber was planted in paired rows of 9.0 m apart. The distance within the paired row was 5.0 m. In the second model, rectangular system of planting (6.7 m x 3.4 m) was followed. Among the annual vegetable intercrops tried, cowpea performed better with an average Benefit Cost Ratio (BCR) of 2.02. Upland rice/Jhum rice also performed well with a BCR of 1.82 in the first year of intercropping under immature rubber. Maize also yielded well with a BCR of 1.89. Among all the annual intercrops, the average BCR proved to be highest (3.29) for colocasia. Among the short term crops, the average BCR for banana was 2.69 and for pineapple it was 2.20. Among the forest species planted in the boundary the girth of acacia (44.3 cm) was significantly higher than gamhari (34.7 cm) eight years after planting of rubber. Fodder grass (signal grass) grown in a single row along the boundary also performed well and the total yield was 252 kg in two cuttings from 300 m row. It was also found that modified paired row system of planting is a workable alternative for the grower who wants to cultivate intercrops for the entire immaturity period. An assessment of the system also indicated sustainability in terms of soil fertility maintenance. Moreover, the mean girth of rubber was found statistically comparable for monocropping and intercropping area in both the Models.

Key words: Benefit-cost ratio, Cropping system, *Hevea brasiliensis*, Planting geometry

INTRODUCTION

Natural rubber has become one of the most important crops in parts of North East India. The scarcity of land prompted the rubber planters to use every inch of the land including the inter space for cultivating food crops. Rubber tree cannot be tapped during the first 6 to 7 years of growth (Sethuraj *et al.*, 1991) and thus smallholders face an initial gap in their income after planting. In the non-traditional areas of India, the period to reach tappable girth is lower (Vinod *et al.*, 1996). This phase is the period of expenses and no returns. A possible solution to this problem lies in raising suitable intercrops in the space available between rows of rubber trees (Noor *et al.*, 1991; Jessy *et al.*, 1998).

Studies have already been conducted to evaluate the performances of different

Correspondence: Bhaskar Datta (E-mail: bhaskardatta@rubberboard.org.in)